

WHAT IS CLAIMED IS:

- 5 1. A process for making nanoscale flakes comprising:
 providing a vacuum deposition chamber containing a deposition
 surface;
 providing a release coat source and a flake deposition source
 in the vacuum deposition chamber, each directed toward the
10 deposition surface;
 depositing on the deposition surface under vacuum in
 alternating layers a vaporized polymeric release coat layer from the
 release coat source and vapor deposited discrete islands of flake
 material from the flake deposition source to build up in sequence a
15 multi-layer vapor deposit of flake material layers comprising
 discrete islands of the flake material separated by and deposited on
 corresponding intervening release coat layers;
 the release coat layers comprising a polymeric material which
 was vaporized under vacuum to form a smooth continuous solvent
20 soluble and dissolvable barrier layer and support surface on which
 each of the layers of flake material is formed; and
 removing the multi-layer vapor deposit from the vacuum
 deposition chamber and separating it into nanoscale flake particles
 by treatment with a solvent which dissolves the release coat layers
25 and yields flakes with smooth, flat surfaces which are essentially
 free of the release coat material.

2. The process according to claim 1 in which the flake layer
 comprises a vapor-deposited material selected from the group
30 consisting of metal in elemental form, an inorganic material, and a
 non-metal.

3. The process according to claim 2 in which the non-metal
 comprises silicon monoxide, silicon dioxide or a polymeric material,
35 in which the inorganic material is selected from the group
 consisting of magnesium fluoride, silicon monoxide, silicon dioxide,

aluminum oxide, aluminum fluoride, indium tin oxide, titanium
dioxide and zinc sulfide, and in which the metal is selected from
5 the group consisting of aluminum, copper, silver, chromium, indium,
nichrome, tin and zinc.

4. The process according to claim 1 in which the release
coat material is selected from styrene or acrylic polymers or blends
10 thereof.

5. The process according to claim 1 in which the flake
layers are deposited to a flake (discrete island) thickness of less
than about 100 nanometers.

6. The process according to claim 1 in which the release
coat layer comprises a thermoplastic polymeric material.

7. The process according to claim 1 in which the release
coat layer comprises a lightly cross-linked resinous material which
20 is dissolvable in an organic solvent to yield the flakes which are
essentially free of the release material.

8. The process according to claim 1 in which the release
25 coat layers are dissolvable in an organic solvent.

9. A process for making flakes comprising:
providing a vacuum deposition chamber containing a deposition
surface;

30 providing a release coat source and a flake deposition source
in the vacuum deposition chamber, each directed toward the
deposition surface;

depositing on the deposition surface under vacuum in
alternating layers a vaporized polymeric release coat layer from the
35 release coat source and a vapor deposited layer of flake material

from the flake deposition source to build up in sequence a multi-layer vapor deposit of flake material layers separated by and deposited on corresponding intervening release coat layers;

the release coat layers comprising a polymeric material which was vaporized under vacuum to form a smooth continuous solvent soluble and dissolvable barrier layer and support surface on which each of the layers of flake material is formed;

in which the release coat source comprises a wire feed mechanism in which the polymeric release coat material is coated onto a wire fed to the vacuum chamber and evaporated under heat therein to be deposited as said release coat layer; and

removing the multi-layer vapor deposit from the vacuum chamber deposition and separating it into flakes by treatment with a solvent which dissolves the release coat layers and yields flakes with smooth, flat surfaces which are essentially free of the release coat material.

10. The process according to claim 9 in which the release coat material is selected from styrene or acrylic polymers or blends thereof.

11. The process according to claim 9 in which the wire feed mechanism delivers the coated release coat material to a heater block positioned adjacent the deposition surface for evaporating the release coat material.